

CLAIMS

1. An ink jet recording element comprising a support and at least one ink-receiving layer, wherein said ink-receiving layer comprises at least one hydrosoluble binder and at least one hybrid aluminosilicate polymer
- 5 obtainable by a preparation method that comprises the following steps:
- a) treating a mixed aluminum and silicon alkoxide of which the silicon has both hydrolyzable substituents and a non-hydrolyzable substituent, or a mixed aluminum and silicon precursor resulting from the hydrolysis of a mixture of aluminum compounds and silicon
- 10 compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent, with an aqueous alkali, in the presence of silanol groups, the aluminum concentration being maintained at less than 0.3 mol/l, the Al/Si molar ratio being maintained between 1 and 3.6 and the alkali/Al molar ratio being
- 15 maintained between 2.3 and 3;
- b) stirring the mixture resulting from step a) at ambient temperature in the presence of silanol groups long enough to form the hybrid aluminosilicate polymer; and
- c) eliminating the byproducts formed during steps a) and b) from the
- 20 reaction medium.
2. The recording element according to Claim 1, wherein the alkali of step a) to prepare the hybrid aluminosilicate polymer is selected from the group consisting of sodium, potassium, or lithium hydroxide, diethylamine, and
- 25 triethylamine.
3. The recording element according to Claim 1, wherein the silanol groups used to prepare the hybrid aluminosilicate polymer are supplied in silica or glass bead form.

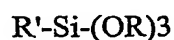
4. The recording element according to Claim 1, wherein the aluminum concentration used to prepare the hybrid aluminosilicate polymer is maintained between 1.4×10^{-2} and 0.3 mol/l.
5. The recording element according to Claim 1, wherein the aluminum concentration used to prepare the hybrid aluminosilicate polymer is maintained between 4.3×10^{-2} and 0.3 mol/l.
6. The recording element according to Claim 1, wherein said
10 alkali/Al molar ratio to prepare the hybrid aluminosilicate polymer is about 2.3.
7. The recording element according to Claim 1, wherein said alkali/Al molar ratio to prepare the hybrid aluminosilicate polymer is about 3.
8. The recording element according to Claim 1, wherein the
15 method for preparing the hybrid aluminosilicate polymer comprises, after step b) and before step c), a step d), by which alkali is added in order to reach an alkali/Al molar ratio of 3 if this ratio has not already been reached in step a).
9. The recording element according to Claim 1, wherein said
20 mixed aluminum and silicon precursor resulting from hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent is a product resulting from the mixture in an aqueous medium (i) of a compound
25 selected from the group consisting of aluminum salts, aluminum alkoxides and aluminum halogenoalkoxides and (ii) at least one compound selected from the group consisting of silicon alkoxides and chloroalkoxides only having hydrolyzable substituents, and (iii) at least one compound selected from the group consisting of silicon alkoxides and chloroalkoxides having a non-hydrolyzable
30 substituent.

10. The recording element according to Claim 9, wherein said mixed aluminum and silicon precursor is the product resulting from the mixture (i) of an aluminum halide and (ii) a mixture having at least one silicon alkoxide only having hydrolyzable substituents and at least one silicon alkoxide having a non-
5 hydrolyzable substituent.

11. The recording element according to Claim 10, wherein the ratio of silicon alkoxide only having hydrolyzable substituents to silicon alkoxide having a non-hydrolyzable substituent is between 0.1 and 10 in moles silicon.
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12. The recording element according to Claim 11, wherein the ratio of silicon alkoxide only having hydrolyzable substituents to silicon alkoxide having a non-hydrolyzable substituent is 1 in moles silicon.

13. The recording element according to Claim 9, wherein the silicon alkoxide having a non-hydrolyzable substituent is represented by the formula
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wherein

R represents an alkyl group comprising 1 to 5 carbon atoms

R' represents H, F, or a substituted or unsubstituted non-linear or ramified alkyl or alkenyl group comprising 1 to 8 carbon atoms.

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14. The recording element according to Claim 13, wherein R' represents a methyl, ethyl, n-propyl, n-butyl, 3-chloropropyl, or vinyl group.

15. The recording element according to Claim 14, wherein said
30 silicon alkoxide having a non-hydrolyzable substituent is methyltriethoxysilane or vinyltriethoxysilane.

16. The recording element according to Claim 10, wherein said silicon alkoxide only having hydrolyzable substituents is tetramethyl orthosilicate or tetraethyl orthosilicate.

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17. The recording element according to Claim 1, wherein the method for preparing the aluminosilicate polymer comprises, after step c), a step e), by which at least one chelating agent of aluminum is added to the hybrid aluminosilicate polymer resulting from step c).

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18. The recording element according to Claim 17, wherein step e) is applied directly on the hybrid aluminosilicate polymer resulting from step c) to prepare a hybrid aluminosilicate polymer resulting from step e) or when a coating composition for the preparation of the ink-receiving layer is prepared by using a hybrid aluminosilicate polymer resulting from step c).

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19. The recording element according to Claim 17, wherein said chelating agent of aluminum is selected from the group consisting of carboxylic acids, phosphonic acids, sulfonic acids, difunctional acids, their ester and anhydride components and amino acids.

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20. The recording element according to Claim 19, wherein said chelating agent of aluminum is selected from the group consisting of HCOOH , R_1COOH wherein R_1 is selected from the group consisting of $\text{CH}_3(\text{CH}_2)_n$, n being between 0 and 12, CF_3 , C_6H_5 , $(\text{C}_6\text{H}_5)_2$, substituted aromatic rings, $\text{C}_4\text{H}_4\text{S}$; $\text{R}_2\text{PO}(\text{OH})_2$ wherein R_2 is selected from the group consisting of CH_3 , C_6H_5 ; $\text{R}_3\text{SO}_3\text{H}$ wherein R_3 is $\text{CH}_3(\text{CH}_2)_n$, n being between 0 and 5; $\text{HOOC}(\text{CH}_2)_n\text{COOH}$, $n = 0-8$; aromatic difunctional acids; $\text{HOOC}(\text{CH}_2)_n\text{PO}(\text{OH})_2$, $n = 2, 4$; hydroxy aliphatic acids; $\text{HOOC}(\text{CH}_2\text{OH})_n\text{COOH}$, $n = 1-2$; $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$.

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21. The recording element according to Claim 17, wherein step e) comprises a first adding of acetic acid and a following adding of another different chelating agent of aluminum.

5 22. The recording element according to Claim 17, wherein the amount of the chelating agent in the ink-receiving layer corresponds to a molar ratio between the chelating functions of the chelating agent and aluminum of the hybrid aluminosilicate polymer, and wherein this molar ratio is greater than 0.1.

10 23. The recording element according to Claim 1, wherein said ink-receiving layer comprises between 5 and 95 percent by weight of hybrid aluminosilicate polymer compared with the total weight of the dry ink-receiving layer.

15 24. The recording element according to Claim 1, wherein the hydrophilic binder is gelatin or polyvinyl alcohol.

25. A coating composition for the preparation of ink-receiving layers for the ink jet recording element according to Claim 1.